

Reconsideration of this application is respectfully requested in light of the following remarks.

Rejections Under 35 U.S.C. 103(a)

Claims 1, 3-9, 26 and 27 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over APAF in view of Maex et al. Claim 25 is finally rejected under 35 U.S.C. 103(a) as being unpatentable over APAF in view of Maex et al and Hedrick et al. Applicant respectfully traverses the rejections for the reasons as follow.

Claim 1 recites a bit line contact structure, comprising a substrate having a transistor thereon, the transistor having a raised gate electrode, a drain region, and a source region; a composite dielectric layer, sequentially having a first dielectric layer, barrier layer, and second dielectric layer, directly on the transistor, the first dielectric layer comprising a spin-coating material, the composite dielectric layer having an opening exposing the drain region; and a conductive layer in the opening.

MPEP 2142 reads in part:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, ***there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.*** Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. ***The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.*** *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). [Emphasis added]

In the rejections, the Examiner combines the structure of APAF with the composite dielectric layer of Maex et al. The motivation for this combination is given as follows:

This configuration of composite interlayer dielectrics allows for a semiconductor device having a low-K dielectric with improved gap filling and planarization. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made

to modify the dielectric layer of the APAF by forming a composite layer as taught by Maex to provide a semiconductor device having a low-K dielectric with improved gap filling and planarization.

See page 3 of the office action.

The Examiner further asserts:

In response to applicant's argument that Maex does not solve the problems of voids, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious.

See page 5 of the office action, with reference to *Ex parte Obiaya*.

Applicant respectfully disagrees with the Examiner's application of *Ex parte Obiaya* in support of the rejection. Namely, the question at hand is not what would flow from the suggestion of the prior art, but whether there is in fact any suggestion to combine the reference teachings in the prior art at all. More specifically, the question is whether or not there is suggestion or motivation in the prior art, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings, thereby establishing a *prima facie* case of obviousness.

The Examiner acknowledges that Maex et al and APAF, taken separately, do not teach all the limitations of claim 1. The references must therefore be combined to teach the claimed invention. But what is the motivation for doing so?

The instant invention teaches the benefits of using a composite dielectric layer on a substrate having a transistor thereon, the transistor having a raised gate electrode, a drain region, and a source region, in preventing voids. However, the teaching or suggestion to make the combination relied upon by the Examiner must be found in the prior art, and not based on Applicant's disclosure.

The Examiner states that Maex et al teach that “[t]he configuration of composite interlayer dielectrics allows for a semiconductor device having a low-K dielectric with improved gap filling and planarization.” In fact, Maex et al teach that low-K organic materials comprising fluorine feature “excellent gap-fill and planarization.” See column 2, lines 1-3 of Maex et al. There is no mention of composite dielectric layers in this regard. Therefore, this teaching cannot be taken as a suggestion or motivation to combine the composite dielectric layer of Maex et al with APAF to improve gap filling.

If Maex et al do not disclose that a composite dielectric layer has good gap filling characteristics, what then is the motivation to combine Maex et al with APAF? The composite dielectric layer in Maex et al is described as providing a low k layer for Cu related interconnect processes on a flattened substrate. However, this teaching also fails to provide any suggestion or motivation to combine the composite dielectric layer of Maex et al with APAF, as suitability for Cu related interconnect processes on a flattened substrate are not pertinent to APAF.

Since Maex et al fail to provide any teaching of the gap filling qualities of the composite dielectric layer, one skilled in the art would not look to Maex et al to solve the void problem in APAF. Furthermore, as Cu related interconnect processes on a flattened substrate are not relevant APAF, Maex et al’s teaching of using the composite dielectric layer to provide a low k layer for Cu related interconnect processes on a flattened substrate also fails to provide suggestion or motivation to combine Maex et al with APAF. Applicant therefore submits the motivation to combine APAF and Maex et al is not found in either the references themselves or in the general knowledge.

The Examiner further asserts:

Maex also teaches the same materials as the instant invention, therefore, those materials would inherently have the same properties and function as the instant invention ... For Maex, the complete device is not shown but the invention is still applicable since it pertains to covering of the substrate and adhesion to subsequent contact structures.

Applicant respectfully disagrees. As described above, Maex et al do not disclose a composite dielectric layer having good filling characteristics to solve gap filling or void problems.

Furthermore, given the flattened substrate, voids formed generated when the dielectric layer is formed are not an issue in Maex et al. Instead, Maex et al use the composite dielectric layer for the low k characteristic used in Cu related interconnect processes on a flattened substrate, which is not pertinent to APAF.

The only teaching that contains a suggestion or motivation to use a composite dielectric layer in connection with the APAF structure is Applicant's own disclosure. Applicant further submits that the benefits of the composite dielectric layer in this regard are unexpected.

Claims 25 and 26 contain limitations similar to those discussed above in connection with claim 1, and the arguments submitted in connection with claim 1 are considered to apply equally to claims 25 and 26.

For at least these reasons, it is Applicant's belief that a *prima facie* case of obviousness cannot be established in connection with claims 1, 25 and 26. Furthermore, as it is Applicant's belief that a *prima facie* case of obviousness is not established for claims 1, 25 and 26, the Examiner's arguments in regard to the dependent claims are considered moot and are not addressed here. Allowance of claims 1, 3-9, and 25-27 is respectfully requested.

Information Disclosure Statement

Applicant notes that an information disclosure statement was filed on November 4, 2005.

Applicant respectfully requests that the Examiner indicate that he has considered the information disclosed the statement by returning a copy of the Form PTO-1449 submitted therewith with his initials or other appropriate mark beside each listed reference.

Conclusion

For the reasons described above, the Applicant believes that the application is now in condition for allowance and respectfully requests so.

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Examiner: Warren, Matthew E, Art Unit 2815
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Respectfully submitted,



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